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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,326	04/12/2004	Chen Zhang	WJT08-0068 (JSF001-0041)	3121
7590	02/14/2006		EXAMINER	
William J. Tucker 14431 Goliad Dr. box 8 Malakoff, TX 75148			BARRECA, NICOLE M	
			ART UNIT	PAPER NUMBER
			1756	
DATE MAILED: 02/14/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/822,326

**Applicant(s)**

ZHANG ET AL.

**Examiner**

Nicole M. Barreca

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7,9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

### DETAILED ACTION

1. Claims 1-7, 9 are pending in this rejection.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 7, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cummings (US 4,336,320) in view of applicant's admitted prior art (AAPA).
4. Cummings discloses a method for making high density interconnection circuitry for multilayered hybrid micropackages. Dielectric thick film paste 21 is formed on ceramic substrate 20 and dried. Photoresist layer 22 is deposited and dried. These two steps may be combined into a single step if the dielectric paste includes a photosensitive constituent (see cl.7). The photosensitive material is then exposed to UV light through a photomask 23. Following exposure the substrate is treated with a developer which simultaneously removes or etches both the photoresist and the dielectric. Dielectric 21 is then fired (sintered) at a temperature of about 800-1000 °C (see col.1, 43-col.2, 21 and claims). Cummings is silent on the exact composition of the dielectric and does not explicitly disclose that the dielectric thick film is tunable. The reference however does teach that the method is used to manufacture high density interconnection circuitry for multilayered hybrid micropackages. The applicant teaches that tunable dielectric materials including barium strontium titanate are known and

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described in the prior art (p.8, l.14-p.9, l.6). It would have been obvious to one of ordinary skill in the art to use a tunable dielectric in the method of making a thick film hybrid micropackage in the method of Cummings because the applicant teaches that tunable dielectric materials are known and described in the prior art.

5. Claims 1, 7, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cummings (US 4,336,320) in view of Sengupta (US 5,766,697).

6. Cummings discloses a method for making high density interconnection circuitry for multilayered hybrid micropackages. Dielectric thick film paste 21 is formed on ceramic substrate 20 and dried. Photoresist layer 22 is deposited and dried. These two steps may be combined into a single step if the dielectric paste includes a photosensitive constituent (see cl.7). The photosensitive material is then exposed to UV light through a photomask 23. Following exposure the substrate is treated with a developer which simultaneously removes or etches both the photoresist and the dielectric. Dielectric 21 is then fired (sintered) at a temperature of about 800-1000 °C (see col.1, 43-col.2, 21 and claims). Cummings is silent on the exact composition of the dielectric and does not explicitly disclose that the dielectric thick film is tunable. The reference however does teach that the method is used to manufacture high density interconnection circuitry for multilayered hybrid micropackages. Sengupta teaches a dielectric composition of barium strontium titanate which has improved electronic properties such as dielectric constants, tunability and low loss (col.2, 1-col.3, 67). It would have been obvious to one of ordinary skill in the art to use a tunable dielectric in the method of making a thick film hybrid micropackage in the method of Cummings

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because Sengupta tunable dielectric such as barium strontium titanate has improved electronic properties.

7. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cummings in view of AAPR or Sengupta as applied to claim 1 above, and further in view of Geist (US 4,772,377).

8. The references are silent on the method used to deposit the thick film dielectric and does not disclose that the thick film is screened printed and thixotropic. Geist teaches screen printing is used in the fabrication of thick film microelectronics such as hybrids and is an established technique for the deposition of thixotropic electronic materials (col.2, 54-68). It would have been obvious to one of ordinary skill in the art to deposit the thixotropic thick film dielectric by screen printing in the method of Cummings in view of AAPR or Sengupta because Geist teaches screen printing is used in the fabrication of thick film microelectronics such as hybrids and is an established techniques for the deposition of thixotropic electronic materials.

9. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cummings in view of AAPR or Sengupta as applied to claim 1 above, and further in view of Maruta (US 5,686,525).

10. The references are silent on the method used to deposit the thick film dielectric and does not disclose that the thick film is screened printed and thixotropic, or that the thick film is spin coated and Newtonian. Maruta teaches in the background that it is known that when screen printing is the method of deposition the coating material is desired to have a thixotropic property, while the coating material is desired to be in the

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form of a Newtonian fluid when the spin coating technique is employed (col.1, 33-41). It would have been obvious to one of ordinary skill in the art to deposit the thixotropic dielectric by screen printing, or to deposit the Newtonian dielectric by spin coating in the method of Cummings in view of AAPR or Sengupta because Maruta teaches in the background that it is known that when screen printing is the method of deposition the coating material is desired to have a thixotropic property, while the coating material is desired to be in the form of a Newtonian fluid when the spin coating technique is employed.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cummings in view of AAPR or Sengupta as applied to claim 1 above, and further in view of Mueller (US 6,097,263).

12. The references are silent on the method used to deposit the thick film dielectric and does not disclose that the thick film is deposited using transfer coating, tape casting or dip coating. Mueller teaches that thick dielectric is typically deposited by tape casting (col.3, 26-29). It would have been obvious to one of ordinary skill in the art to deposit the thick film dielectric by tape casting in the method of Cummings in view of AAPR or Sengupta because Mueller teaches that thick dielectric is typically deposited by tape casting.

### ***Response to Arguments***

13. Applicant's arguments filed 12/1/05 have been fully considered but they are not persuasive. The applicant argues that the amendments to claim 1 overcome the prior art of record. The claims as written only require one component of the selected group.

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Cummings teaches that the dielectric paste includes a photosensitive constituent.

Additionally one of ordinary skill in the art would have to expect that a dielectric paste including a photosensitive constituent would have to include a solvent in order to mix the components and to apply the mixture onto the substrate. Further evidence of the inclusion of the solvent is the teaching in Cummings to drying the paste after deposition, as is conventionally used in the art in order to remove solvents.

14. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation is found in the references themselves. Cummings teaches a method using a thick film photosensitive dielectric paste, while applicant admitted prior art teaches tunable dielectric materials including barium strontium titanate are known and described in the prior art and Sengupta teaches a dielectric composition of barium strontium titanate which has improved electronic properties such as dielectric constants, tunability and low loss. The applicant also teaches in the Background of the Invention that it is known in the prior art to use thick film technology such as screening printing to manufacture Parascan tunable capacitors (p.1, 12-14), contrary to the argument that a tunable

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dielectric material of the present invention is not readily conducive to use in the process of Cummings.

15. The applicant also argues that dielectric material that is made tunable utilizing the correct material is far more difficult to accomplish than the method suggest by Cummings. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

### ***Conclusion***

16. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.



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17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicole M. Barreca whose telephone number is 571-272-1379. The examiner can normally be reached on Monday-Thursday (9AM-7PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F. Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nicole M Barreca  
Primary Examiner  
Art Unit 1756



2/9/06